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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,053	02/11/2004	Seok-jun Won	SAM-0538	2126

7590

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EXAMINER

GARCIA, JOANNIE A

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/776,053	WON ET AL.	
	Examiner	Art Unit	
	Joannie A. García	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 12-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 and 12-17 is/are allowed.
- 6) ☒ Claim(s) 29-41 is/are rejected.
- 7) ☒ Claim(s) 18-28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
- 1. ☒ Certified copies of the priority documents have been received.
- 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03-21-05</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

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Claims 18-28 are objected to because of the following informalities:

Claim 18 recites the limitation "surface of the lower metal electrode" in line 4. There is insufficient antecedent basis for this limitation in the claim.

In claim 18, line 6, "a" before "surface" should be replaced with --the--.

In claim 21, line 8, "an" before "etchant", should be replaced with --the--.

In claim 25, line 7, "an" after "different etchant than" and before "etchant", second occurrence, should be replaced with --the--.

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 29, 32, 34, 37, 38, and 41, are rejected under 35 U.S.C. 102(b) as being anticipated by Chien et al (U.S. Patent 6,010,942).

Chien et al discloses forming a lower electrode 12/13 of a capacitor (Figures 2-3, and Column 4, lines 57-67), performing a primary wet treatment on a surface of the lower electrode to remove unwanted surface oxides from the surface of the lower electrode, wherein the primary wet treatment is performed using SC1, or HF, as an etchant (Figures 5-6, Column 2, lines 24-28, Column 3, lines 18-22, Column 5, lines 40-45, and 52-57, and Column 7, lines 28-31), subsequent to performing the primary wet treatment, performing a secondary wet treatment on the surface of the lower electrode by using a different etchant than an etchant used in the primary

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wet treatment to remove a remaining residue of unwanted surface oxides and unwanted surface organic materials from the surface of the lower electrode, wherein the secondary wet treatment is performed using  $\text{H}_2\text{SO}_4$  and  $\text{H}_2\text{O}_2$  as an etchant (Figure 8, Column 2, lines 28-30, Column 3, lines 21-25, Column 5, lines 59-61, and Column 7, lines 35-37), forming a tantalum oxide dielectric layer 16 on the lower electrode (Figure 9, and Column 6, lines 2-5, and 15-18), and forming an upper electrode 17 on the dielectric layer (Figure 9, and Column 6, lines 18-27).

Claims 30, 31, 33, 35, 36, 39, and 40, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chien et al as applied to claims 29, 32, 34, 37, 38, and 41, above, and further in view of Lee et al (U.S. Patent 6,287,910), and the following comments.

Chien et al discloses forming the lower and upper electrodes using polysilicon as the electrode materials of the capacitor (Figures 2-3, and Column 4, lines 57-67). Chien et al does not teach using titanium nitride as the material for the upper and lower electrodes of the capacitor. Lee et al discloses the use of polysilicon, titanium nitride, titanium, or tantalum nitride, among other materials, as lower and upper electrode materials in the manufacture of a capacitor (Column 5, lines 31-37). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Chien et al and Lee et al to enable the step of forming lower electrode 12/13 of Chien et al to be performed, by employing either of the materials disclosed by Lee et al.

Chien et al discloses using the SC1 as an etchant at a temperature of 70 °C to 80 °C (Column 5, lines 40-45, and Column 7, lines 28-31). Chien et al discloses the claimed invention except for using the SC1 as an etchant at a temperature of 30 °C to 50 °C. It would have been

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obvious to one having ordinary skill in the art at the time the invention was made to determine a suitable temperature range, to achieve the primary wet treatment of Chien et al to be performed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

In addition, the selection of a suitable temperature range, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In *re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed temperatures or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen temperatures or upon another variable recited in a claim, the Applicant must show that the chosen temperatures are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 19-20, 22-24, and 26-28, would be allowable if rewritten to overcome the objection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 18, 21, and 25, would be allowable if rewritten or amended to overcome the objection(s) set forth in this Office action.

Claims 1-4, and 12-17, are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joannie Garcia whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
George Fourson  
Primary Examiner  
Art Unit 2823

  
JAG

July 6, 2005

GFourson  
Primary Examiner